

CLAIMS

We claim:

1. A method to identify a potential target from image data representing a scene, comprising:

performing at least one of a pre-detection temporal fusion and a pre-detection spatial fusion of the image data; and

thresholding the image data after performing the step of performing.

2. The method of claim 1, wherein:

performing the pre-detection temporal fusion comprises temporally integrating the image data from a particular sensor across a plurality of time frames; and

performing the pre-detection spatial fusion comprises fusing the image data from a plurality of sensors across a single time frame.

3. The method of claim 1, wherein the pre-detection temporal fusion and the pre-detection spatial fusion includes at least one of an additive fusion, multiplicative fusion, minimum fusion, and maximum fusion.

4. The method of claim 1, wherein the thresholding includes at least one of:
a double-thresholding wherein an upper and a lower bound thresholds are set to identify the potential target; and

a reverse-thresholding wherein a potential target identification level is set to be below a particular threshold.

5. A method to identify a potential target from image data of a scene, comprising:

thresholding the image data from across multiple time frames or multiple sensor platforms; and

fusing the image data after performing the thresholding.

6. The method of claim 5, wherein the thresholding includes at least one of:

double-thresholding the image data, wherein an upper and a lower bound threshold are set to identify the potential target; and

reverse-thresholding wherein a potential target identification level is set to be below a particular threshold.

7. The method of claims 1 or 5, wherein said step of thresholding produces thresholded image data, the method further comprising:

identifying candidate targets from the thresholded image data.

8. A device to identify potential targets from image data representative of a scene, comprising:

a fusion module configured to perform at least one of integrating the image data across a plurality of time frames and integrating a plurality of images in a single time frame; and

a threshold module configured to apply thresholding techniques on the image data.

9. The device of claim 8 wherein said device further includes at least one sensor configured to sense the scene across the plurality of time frames.

10. The device of claim 8, wherein fusion module is configured to perform at least one of an additive fusion, multiplicative fusion, minimum fusion, and maximum fusion.

11. The device of claim 8, wherein the fusion module is configured to perform at least one of a pre-detection fusion and a persistence test.

12. The device of claim 8, wherein the threshold module is configured to perform at least one of a double-thresholding technique and a reverse-thresholding technique.

13. A method to identify a potential target from data, comprising the steps of:
providing data from at least a single sensor; and
performing a pre-detection technique on data corresponding to at least one extracted feature from a plurality of time frames of data from the single sensor;
wherein said pre-detection technique includes either a double threshold technique or a reverse threshold technique.

14. A method according to claim 13 which further includes the step of:
performing a post-detection technique to determine whether a certain criteria has been met.

15. A method according to claim 14 wherein said double threshold technique includes setting a detection criteria having a lower bound threshold value and an upper bound threshold for determining whether an object corresponding to the extracted feature has a feature value between the lower bound threshold value and upper bound threshold value.

16. A method according to claim 15 wherein said reverse threshold technique includes setting a detection criteria for a non-stationary object such that a mean value of an extracted feature is compared to a target mean value, and the extracted feature is determined to be a non-stationary object when its mean value is greater or lesser than the target mean value.

17. A method to identify a potential target from data, comprising the steps of:
providing data from at least a plurality of sensors; and
performing a pre-detection fusion technique on data corresponding to at least one extracted feature from each sensor;

wherein said pre-detection fusion technique includes at least one technique that is selected from a group comprised of additive fusion, multiplicative fusion, minimum fusion and maximum fusion.

18. A method according to claim 17 which further includes the step of:
performing a post-detection technique when there is data from at least three sensors, said post-detection technique selected from a group consisting of a double threshold technique and a reverse threshold technique.

19. A method according to claim 18 wherein said double threshold includes setting a detection criteria having a lower bound threshold value and an upper bound threshold for determining whether an object corresponding to the extracted feature has a feature value between the lower bound threshold value and upper bound threshold value.

20. A method according to claim 18 wherein said reverse threshold technique includes setting a detection criteria for a non-stationary object such that a mean value of an extracted feature is compared to a target mean value, and the extracted feature is determined to be a non-stationary object when its mean value is greater or lesser than the target mean value.

21. A target detection apparatus, comprising:

- a plurality of sensors for outputting data related to a target, said data from each sensor having a plurality of time frames;
- temporal processing means for integrating the data supplied from each of said plurality of sensors;
- spatial processing means for fusing the temporally integrated sensor data from said temporal processing means, wherein said spatial processing means detects the target from the spatially fused data and provides an indication corresponding to the detected target;
- and
- means for utilizing the indication of the detected target.